

# PATENT ABSTRACTS OF JAPAN

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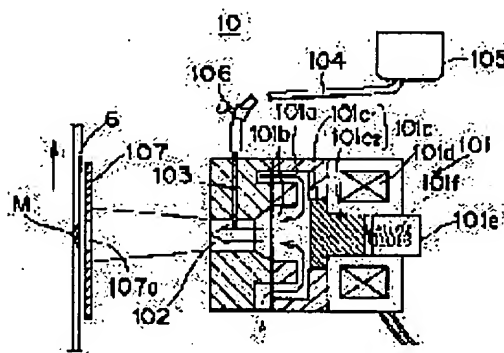
TAKADA KAZUHIKO

## (54) LONG STRIP BAND-MARKING APPARATUS

### (57)Abstract:

**PURPOSE:** To provide a long strip band-marking apparatus which has a simple structure, economical, hardly has a trouble, and makes desiring band marks on a long strip moving at a high speed.

**CONSTITUTION:** A flow route between an inlet 101a and an outlet 101b of air is opened and closed by an air valve 101 to release air from the outlet and shut air. Air which is released from the outlet is throttled by a Venturi part 102 connected to the outlet of the air valve to increase the flow rate of the air. A paint supplied to the Venturi part through a paint supplying nozzle 103 is atomized and sprayed to the surface of a long strip article 6 and form band marks on the surface by the air released from the outlet of the air valve.



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CLAIMS

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[Claim(s)]

[Claim 1] The air bulb which has the inlet port to which air is supplied from the source of air supply, and the outlet which emits the air supplied to this inlet port, opens and closes the passage between said inlet ports and outlets, and was made to perform emission and cutoff of the air from said outlet, The venturi tube section which is connected with said outlet of this air bulb, extracts the air emitted from this outlet, and raises the rate of flow, It has the coating supply noise which is projected by these venturi tube circles and supplies a coating. \*\*\*\*\* band marking equipment characterized by atomizing the coating supplied to said venturi tube circles from a coating supply nozzle by the air emitted from the outlet of said air bulb, blowing off on the surface of \*\*\*\*\*, and giving a band mark.

[Claim 2] \*\*\*\*\* band marking equipment characterized by changing the color of the coating which supplies \*\*\*\*\* band marking equipment according to claim 1 from said coating supply nozzle of two or more preparations and monograph length object band marking equipment, and giving a multicolor band mark to the front face of said \*\*\*\*\*.

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to \*\*\*\*\* band marking equipment, and relates to the \*\*\*\*\* band marking equipment which sets spacing on the front face by coating injection by the injection nozzle, and gives a band (band-like) mark to \*\*\*\*\*, such as an electric wire which carried out pre-insulation with wire covering ingredients, such as thermoplastics, especially, or a cable.

[0002]

[Description of the Prior Art] Conventionally, generally the electric-wire band marking equipment used in electric-wire extrusion Rhine as shown in drawing 6 is known as \*\*\*\*\* band marking equipment which was mentioned above. In electric-wire extrusion Rhine of illustration, a core wire 3 is pulled out from the core wire bundle 2 wound around the drum 1 for core wires, and it is sent to wire covering arrival equipment 4. In wire covering arrival equipment 4, the wire covering ingredient from the wire covering ingredient tank 5 is given to the periphery of a core wire 3, and a cable 6 is formed. The covering material immediately after electric-wire formation is soft, and in order to harden this, an electric wire 6 is sent through a cooling water tank 7, finally is rolled round by the drum 8 for electric-wire winding, and is made into the electric-wire bundle 9.

[0003] Between the above-mentioned wire covering arrival equipment 4 and a cooling water tank 7, it counters on both sides of an electric wire 6, and a location is mutually shifted along the transit direction of an electric wire 6, and it is electric-wire band marking equipment 101 of a pair. And 102 It is installed. Electric-wire band marking equipment 101 of this pair And 102 It is controlled by the control unit 12 which inputs the linear velocity signal from the encoder 11 which detects the linear velocity of a core wire 3.

[0004] Each electric-wire band marking equipment has coating injection nozzle 10a, as shown in drawing 7, and a coating is supplied to the base of this coating injection nozzle 10a through tube 10b with the pump which is not illustrated from the coating tank which held the coating of the band mark color given to the periphery of an electric wire 6, and which is not illustrated. As the drawing Nakaya mark shows by actuator connected with 10d of the rotation shafts when giving band mark to electric wire 6, although [ held at the level condition of the illustration which coating injection nozzle 10a is supported to revolve free / rotation in the include-angle range with the fixed base /, and coating injection-tip of the tip 10c always counters with an electric wire 6 ], and 10e, a both-way rotation drive is carried out.

[0005] If the both-way rotation drive of the coating injection nozzle 10a is carried out by actuator 10e, the coating which blows off from coating injection-tip 10c vibrates in a flat surface perpendicular to the transit direction of an electric wire 6, and it comes to lenticulate, and when this jet coating that lenticulated crosses an electric wire 6 and moves, it will come to give a band mark to one side face of the periphery of an electric wire 6. The excessive coating which flew to the back of an electric wire 6 can be received by 10f of coating receptacles, and are collected by the coating tank mentioned above.

[0006] The principle of band marking mentioned above is explained more to a detail with reference to drawing 8. Drawing 8 shows the case where coating injection nozzle 10a moves along with an electric wire 6 instead of an electric wire 6, and the coating injected from coating injection nozzle 10a vibrates periodically like illustration, and it comes to cross it periodically with an electric wire 6. In an electric wire 6, it is one electric-wire marking equipment 101 by this. As shown in drawing 9 (a), it is the band mark M1 at fixed spacing to one side face of that periphery. It is given. moreover, electric-wire band

marking equipment 101 from -- this is given to the other side faces of the periphery of an electric wire 6 although the same band mark is given also by the electric-wire band marking equipment 102 which estranged and was installed in the opposite side on both sides of the electric wire 6. Therefore, both electric-wires band marking equipment 101 And 102 Band mark M1 given with both equipments, respectively as it is made to operate synchronizing with mutual and is shown in drawing 9 (b) And M2 By making a location in agreement, a band mark is formed covering the abbreviation perimeter side of the periphery of an electric wire 6.

[0007] The band mark of an electric wire 6 is electric-wire band marking equipment 101 of the pair of drawing 6 R> 6, although the coating color expresses information, such as a size of the core wire, and insulating strength. And 102 In order to give the band mark of various colors, it is necessary to change the color of a coating. For example, in order to enable it to perform 2 color change, as it is shown in drawing 10 , it is two coating tank 10g1. And 10g2 One side is connected to pump 10i through change bulb 10h, the coating spouted from one coating injection nozzle 10a by switching change bulb 10h is changed, and a color substitute of a band mark is performed.

[0008] However, if change bulb 10h is switched for recoloring, since it would change to from change bulb 10h before injection nozzle 10a and the front coating will remain, the band mark of a color with which a residual coating and a new coating mixed the coating to an electric wire 6 after this change shortly after performing injection comes to be attached. for this reason, everything but two coating tanks -- penetrant remover tank 10g3 preparing -- the time of recoloring -- once scouring-kier 10g3 from -- after supplying a penetrant remover to injection nozzle 10a through change bulb 10h and flushing a front residual coating, it performs changing to a new coating tank.

[0009] Moreover, since the band mark of the color from which plurality differs is given and the combination of the color of this band mark expresses information, such as a size of the core wire of an electric wire, and insulating strength, as it is shown in drawing 11 , it is electric-wire band marking equipment 101 of a pair. And 102 Otherwise, it is two electric-wire bands marking equipment 103. 104 And 105 And 106 There are some which it has. With this equipment, it can give combining the band mark of 2-3 kinds of colors, using three electric-wire bands marking equipment alternatively. In addition, drawing 12 shows the electric wire 6 which repeated and gave the band marks Ma, Mb, and Mc of three colors with the equipment of drawing 11 .

[0010] this equipment -- setting -- for example, the combination of the color of the band mark of two colors -- on the way -- injection nozzle 10a which spouts a coating when coming out and changing -- for example, equipment 101 And 102 from -- equipment 103 And 104 Although it is necessary to change It is required to wash injection nozzle 10a immediately after suspending use so that it may become impossible to spout a coating from injection nozzle 10a when a coating tends to remain in injection nozzle 10a which was blowing off, a coating tends to be solidified until now at this time and it is going to use it for a degree.

[0011]

[Problem(s) to be Solved by the Invention] Although it vibrates and the coating which is supplied with a pump and blows off from coating injection-tip 10c continuously was waved in the flat surface perpendicular to the transit direction of an electric wire 6 with the electric-wire band marking equipment of drawing 7 mentioned above in order to give a band mark to one side face of the periphery of an electric wire 6 for this reason, the both-way rotation drive of the injection nozzle 10a needed to be carried out by actuator 10e, and that bore needed to be made very small.

[0012] Moreover, when there was moving-part material which consists of injection nozzle 10a which carries out both-way rotation in this way, equipment became complicated and became expensive, and also it had become the cause of failure. Furthermore, a limitation is in the velocity of vibration of the coating by the injection nozzle, and the travel speed of \*\*\*\*\* which gives a band mark is restricted.

[0013] Furthermore, it was required to wash injection nozzle 10a so that the coating which remains in the pump or the injection noise might not be mixed with a new coating, when supplying the coating of other colors to the injection noise same for the recoloring of a band mark, by this washing, electric-wire extrusion Rhine was stopped, or it was necessary to disconnect an electric wire 6, and there was a trouble of reducing the operating ratio of electric-wire extrusion Rhine.

[0014] And since the bore of an injection noise was very small and the residual coatings in the injection nozzle which stopped injection etc. solidified immediately when the injection noise of a specific group was chosen from two or more sets of injection noises and recoloring of a band mark was performed like the equipment of drawing 11 , it was required to wash injection nozzle 10a which stopped injection.

Since disconnecting an electric wire 6 was performed while stopping electric-wire extrusion Rhine by this washing, there was same trouble with having mentioned above.

[0015] Therefore, in view of the conventional trouble mentioned above, a configuration is easy, this invention is cheap, and there is little failure, and it sets it as the main purpose to offer the \*\*\*\*\* band marking equipment which can give a desired band mark to \*\*\*\*\* which moreover moves at high speed.

[0016] Moreover, this invention sets it as the 2nd purpose to offer the \*\*\*\*\* band marking equipment it enabled it to perform, without having suspended transit of \*\*\*\*\* for the recoloring of the band mark given to \*\*\*\*\* in view of the conventional trouble mentioned above, or cutting \*\*\*\*\*.

[0017]

[Means for Solving the Problem] The \*\*\*\*\* band marking equipment accomplished by this invention in order to attain the above-mentioned main slack purposes The air bulb which has the inlet port to which air is supplied from the source of air supply, and the outlet which emits the air supplied to this inlet port, opens and closes the passage between said inlet ports and outlets, and was made to perform emission and cutoff of the air from said outlet, The venturi tube section which is connected with said outlet of this air bulb, extracts the air emitted from this outlet, and raises the rate of flow, It is characterized by having the coating supply noise which is projected by these venturi tube circles and supplies a coating, atomizing the coating supplied to said venturi tube circles from a coating supply nozzle by the air emitted from the outlet of said air bulb, blowing off on the surface of \*\*\*\*\* , and giving a band mark.

[0018] The \*\*\*\*\* band marking equipment accomplished by this invention in order to attain the 2nd purpose of the above changes the color of the coating which supplies the above-mentioned \*\*\*\*\* band marking equipment from said coating supply nozzle of two or more preparations and monograph length object band marking equipment, and is characterized by giving a multicolor band mark to the front face of said \*\*\*\*\*.

[0019]

[Function] By an air bulb opening and closing the passage between an inlet port and an outlet, and performing emission and cutoff of the air from an outlet by the above-mentioned configuration Only the period when emission of the air from an air bulb to the venturi tube section was controlled at, and air was emitted to the venturi tube section with the air accelerated here Since the coating currently supplied from the coating supply noise is atomized, and blows off and a band mark is given on the surface of \*\*\*\*\* by this jet coating, there is no moving-part material seemingly, and the change rate of jet of a coating is dependent only on the closing motion rate of the passage in an air bulb.

[0020] Moreover, since the coating currently supplied from the coating supply noise is atomized and blows off, even if a coating does not remain to venturi tube circles and it stops jet of a coating, it is not necessary to wash the venturi tube section.

[0021]

[Example] Hereafter, the example of this invention is explained based on a drawing. Drawing 1 shows the electric-wire band marking equipment which is one example of the \*\*\*\*\* band marking equipment by this invention. the electromagnetism which intercepts and emits the air supplied in this drawing from the source of air supply which does not illustrate electric-wire band marking equipment 10 -- it has the drive-type air bulb 101. Air inlet 101a is formed in the periphery section, and air-outlet 101b is formed in the center section at the air bulb 101, respectively. And valve element 101c to which the air which opened and closed passage and was supplied to air inlet 101a makes it emit from air-outlet 101b, or intercepts emitting is prepared in the airstream way which connects air inlet 101a and air-outlet 101b. [0022] valve portion 101c1 which valve element 101c consists of a magnetic material, and opens and closes passage electromagnetism -- the adsorption section 101c2 inserted into the coil 101d centrum from -- it becomes. valve element 101c -- electromagnetism -- coil spring 101f \*\*\*\*(ed) between piece of adsorption 101e of the shape of a cap fixed in the coil 101d centrum -- always -- passage -- valve portion 101c1 although energized in the closed direction -- electromagnetism -- if it energizes to coil 101d, the coil spring 101f energization force will be resisted, and it will be drawn in by piece of adsorption 101e, and will be held at the open condition of illustration.

[0023] Electric-wire band marking equipment 10 has the venturi tube section 102 connected with air-outlet 101b of the air bulb 101, and this venturi tube section 102 extracts the air emitted from air-outlet 101b, and raises the spray velocity. The tip of the coating supply nozzle 103 is projected in the venturi tube section 102, and the coating from the coating tank 105 is supplied through the pipe 104 linked to

the back end of the coating supply nozzle 103 out of the venturi tube section 102. The cock 106 for coating flow control is formed in the middle of the pipe 104.

[0024] If valve element 101c of the air bulb 101 carries out open like illustration, from air-outlet 101b, air will be emitted, this air will be accelerated in the venturi tube section 102, and it will blow off from the outlet of the venturi tube section 102. At this time, in the venturi tube section 102, the coating from the coating supply nozzle 103 with which the tip is projected is atomized, and it blows off together with air. The coating which was atomized and blew off from the venturi tube section 102 is restricted by slit 107a of the mask plate 107 which adjoined the electric wire 6 it is running in the direction of an arrow head, and has been arranged, the front face of an electric wire 6 adheres to the coating which passed along this slit 107a, and the band mark M is given to an electric wire 6.

[0025] the electromagnetism of the air bulb 101 -- if the energization to coil 101d is solved, as valve element 101c is moved by the energization force by spring coil 101f and it is shown in drawing 2, the airstream way which connects air inlet 101a and air-outlet 101b will be closed, and it will intercept that the air currently supplied to air inlet 101a is emitted from air-outlet 101b. Therefore, the coating supplied through the coating supply nozzle 103 in the venturi tube section 102 is atomized, and it does not blow off together with air.

[0026] In addition, while a required coating is absorbed in the venturi tube section 102 from the tip of the coating supply nozzle 103 by suction by this airstream while air is blowing off from the venturi tube section 102, and air is not blowing off by adjustment of the coating amount of supply by the flow control cock 106, a coating is made not to be dropped in the venturi tube section 102 from the coating supply nozzle 103.

[0027] As explained above, since a band mark can be given to the front face of an electric wire 6, while being able to turn jet of a coating on and off at high speed, only by carrying out the switching action of the valve element 101c of the air bulb 101, moving-part material can be lost externally, and structure becomes easy so much, and it is cheap and can consider as equipment with little failure.

[0028] Moreover, since carry out open and air is made to emit in the venturi tube section 102 from air-outlet 101b, and valve element 101c of the air bulb 101 atomizes the coating from the coating supply nozzle 103 and is blowing off with this air when giving a band mark to the front face of an electric wire 6, the venturi tube section 102 can be made into what has a comparatively big bore. Moreover, when valve element 101c of the air bulb 101 closes and air is no longer emitted to the venturi tube section 102, a coating does not remain in the venturi tube section 102. Therefore, coating supply nozzle 1031-1032 which supplies two or more coatings with which colors differ in the venturi tube section 102 as show in drawing 3 R> 3 The color of the band mark give on the surface of an electric wire is easily replaceable by make a tip project and open alternatively the cock who prepared in the pipe between these coating supply nozzles and coating tanks, respectively.

[0029] Since a coating does not remain in the venturi tube section 102 when air is intercepted and jet of a coating is stopped, as mentioned above As shown in drawing 4, they are two or more air bulbs 1011-1014. The venturi tube section 1021-1024 connected, respectively While summarizing an outlet to one each venturi tube section 1021-1024 Coating tank 1051-1054 which held the coating of a different color from -- coating supply nozzle 1031-1034 which supplies a coating It prepares. Air bulb 1011-1014 By opening and closing a valve element alternatively at high speed, the band mark of the monochrome from which versatility differs, or a mixed color can be given to an electric wire 6 now.

[0030] Moreover, as shown in drawing 5, the electric-wire band marking equipment of a configuration of having mentioned above about drawing 1 On both sides of an electric wire 6, a location is shifted in the transit direction, and it arranges four at a time, and is equipment 101. 105 And equipment 102 And 106 Like Moreover by making two equipments which counter into a group and making the coating of the same color blow off, the band mark covering the perimeter of an electric wire 6 can be given without washing combining various colors with multiple color.

[0031]

[Effect of the Invention] Since according to this invention a configuration is easy, it is cheap, and there is little failure, since there is no moving-part material seemingly and also the change rate of jet of a coating is dependent only on the closing motion rate of the passage in an air bulb as explained above, a desired band mark can be given to \*\*\*\*\* which moves at high speed.

[0032] Moreover, since it is not necessary to wash the venturi tube section even if a coating does not remain to venturi tube circles and it stops jet of a coating, it can carry out, without suspending transit of \*\*\*\*\* for the recoloring of the band mark given to \*\*\*\*\* , or cutting \*\*\*\*\*.

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TECHNICAL FIELD

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[Industrial Application] This invention relates to \*\*\*\*\* band marking equipment, and relates to the \*\*\*\*\* band marking equipment which sets spacing on the front face by coating injection by the injection nozzle, and gives a band (band-like) mark to \*\*\*\*\*, such as an electric wire which carried out pre-insulation with wire covering ingredients, such as thermoplastics, especially, or a cable.

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## PRIOR ART

[Description of the Prior Art] Conventionally, generally the electric-wire band marking equipment used in electric-wire extrusion Rhine as shown in drawing 6 is known as \*\*\*\*\* band marking equipment which was mentioned above. In electric-wire extrusion Rhine of illustration, a core wire 3 is pulled out from the core wire bundle 2 wound around the drum 1 for core wires, and it is sent to wire covering arrival equipment 4. In wire covering arrival equipment 4, the wire covering ingredient from the wire covering ingredient tank 5 is given to the periphery of a core wire 3, and a cable 6 is formed. The covering material immediately after electric-wire formation is soft, and in order to harden this, an electric wire 6 is sent through a cooling water tank 7, finally is rolled round by the drum 8 for electric-wire winding, and is made into the electric-wire bundle 9.

[0003] Between the above-mentioned wire covering arrival equipment 4 and a cooling water tank 7, it counters on both sides of an electric wire 6, and a location is mutually shifted along the transit direction of an electric wire 6, and it is electric-wire band marking equipment 101 of a pair. And 102 It is installed. Electric-wire band marking equipment 101 of this pair And 102 It is controlled by the control unit 12 which inputs the linear velocity signal from the encoder 11 which detects the linear velocity of a core wire 3.

[0004] Each electric-wire band marking equipment has coating injection nozzle 10a, as shown in drawing 7, and a coating is supplied to the base of this coating injection nozzle 10a through tube 10b with the pump which is not illustrated from the coating tank which held the coating of the band mark color given to the periphery of an electric wire 6, and which is not illustrated. As the drawing Nakaya mark shows by actuator connected with 10d of the rotation shafts when giving band mark to electric wire 6, although [ held at the level condition of the illustration which coating injection nozzle 10a is supported to revolve free / rotation in the include-angle range with the fixed base /, and coating injection-tip of the tip 10c always counters with an electric wire 6 ], and 10e, a both-way rotation drive is carried out.

[0005] If the both-way rotation drive of the coating injection nozzle 10a is carried out by actuator 10e, the coating which blows off from coating injection-tip 10c vibrates in a flat surface perpendicular to the transit direction of an electric wire 6, and it comes to lenticulate, and when this jet coating that lenticulated crosses an electric wire 6 and moves, it will come to give a band mark to one side face of the periphery of an electric wire 6. The excessive coating which flew to the back of an electric wire 6 can be received by 10f of coating receptacles, and are collected by the coating tank mentioned above.

[0006] The principle of band marking mentioned above is explained more to a detail with reference to drawing 8. Drawing 8 shows the case where coating injection nozzle 10a moves along with an electric wire 6 instead of an electric wire 6, and the coating injected from coating injection nozzle 10a vibrates periodically like illustration, and it comes to cross it periodically with an electric wire 6. In an electric wire 6, it is one electric-wire marking equipment 101 by this. As shown in drawing 9 (a), it is the band mark M1 at fixed spacing to one side face of that periphery. It is given. moreover, electric-wire band marking equipment 101 from -- this is given to the other side faces of the periphery of an electric wire 6 although the same band mark is given also by the electric-wire band marking equipment 102 which estranged and was installed in the opposite side on both sides of the electric wire 6. Therefore, both electric-wires band marking equipment 101 And 102 Band mark M1 given with both equipments, respectively as it is made to operate synchronizing with mutual and is shown in drawing 9 (b) And M2 By making a location in agreement, a band mark is formed covering the abbreviation perimeter side of the periphery of an electric wire 6.

[0007] The band mark of an electric wire 6 is electric-wire band marking equipment 101 of the pair of drawing 6 R> 6, although the coating color expresses information, such as a size of the core wire, and insulating strength. And 102 In order to give the band mark of various colors, it is necessary to change the color of a coating. For example, in order to enable it to perform 2 color change, as it is shown in drawing 10 , it is two coating tank 10g1. And 10g2 One side is connected to pump 10i through change bulb 10h, the coating spouted from one coating injection nozzle 10a by switching change bulb 10h is changed, and a color substitute of a band mark is performed.

[0008] However, if change bulb 10h is switched for recoloring, since it would change to from change bulb 10h before injection nozzle 10a and the front coating will remain, the band mark of a color with which a residual coating and a new coating mixed the coating to an electric wire 6 after this change shortly after performing injection comes to be attached. for this reason, everything but two coating tanks -- penetrant remover tank 10g3 preparing -- the time of recoloring -- once scouring-kier 10g3 from -- after supplying a penetrant remover to injection nozzle 10a through change bulb 10h and flushing a front residual coating, it performs changing to a new coating tank.

[0009] Moreover, since the band mark of the color from which plurality differs is given and the combination of the color of this band mark expresses information, such as a size of the core wire of an electric wire, and insulating strength, as it is shown in drawing 11 , it is electric-wire band marking equipment 101 of a pair. And 102 Otherwise, it is two electric-wire bands marking equipment 103. 104 And 105 And 106 There are some which it has. With this equipment, it can give combining the band mark of 2-3 kinds of colors, using three electric-wire bands marking equipment alternatively. In addition, drawing 12 shows the electric wire 6 which repeated and gave the band marks Ma, Mb, and Mc of three colors with the equipment of drawing 11 .

[0010] this equipment -- setting -- for example, the combination of the color of the band mark of two colors -- on the way -- injection nozzle 10a which spouts a coating when coming out and changing -- for example, equipment 101 And 102 from -- equipment 103 And 104 Although it is necessary to change It is required to wash injection nozzle 10a immediately after suspending use so that it may become impossible to spout a coating from injection nozzle 10a when a coating tends to remain in injection nozzle 10a which was blowing off, a coating tends to be solidified until now at this time and it is going to use it for a degree.

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EFFECT OF THE INVENTION

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[Effect of the Invention] Since according to this invention a configuration is easy, it is cheap, and there is little failure, since there is no moving-part material seemingly and also the change rate of jet of a coating is dependent only on the closing motion rate of the passage in an air bulb as explained above, a desired band mark can be given to \*\*\*\*\* which moves at high speed.

[0032] Moreover, since it is not necessary to wash the venturi tube section even if a coating does not remain to venturi tube circles and it stops jet of a coating, it can carry out, without suspending transit of \*\*\*\*\* for the recoloring of the band mark given to \*\*\*\*\*, or cutting \*\*\*\*\*.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] Although it vibrates and the coating which is supplied with a pump and blows off from coating injection-tip 10c continuously was waved in the flat surface perpendicular to the transit direction of an electric wire 6 with the electric-wire band marking equipment of drawing 7 mentioned above in order to give a band mark to one side face of the periphery of an electric wire 6 for this reason, the both-way rotation drive of the injection nozzle 10a needed to be carried out by actuator 10e, and that bore needed to be made very small.

[0012] Moreover, when there was moving-part material which consists of injection nozzle 10a which carries out both-way rotation in this way, equipment became complicated and became expensive, and also it had become the cause of failure. Furthermore, a limitation is in the velocity of vibration of the coating by the injection nozzle, and the travel speed of \*\*\*\*\* which gives a band mark is restricted.

[0013] Furthermore, it was required to wash injection nozzle 10a so that the coating which remains in the pump or the injection noise might not be mixed with a new coating, when supplying the coating of other colors to the injection noise same for the recoloring of a band mark, by this washing, electric-wire extrusion Rhine was stopped, or it was necessary to disconnect an electric wire 6, and there was a trouble of reducing the operating ratio of electric-wire extrusion Rhine.

[0014] And since the bore of an injection noise was very small and the residual coatings in the injection nozzle which stopped injection etc. solidified immediately when the injection noise of a specific group was chosen from two or more sets of injection noises and recoloring of a band mark was performed like the equipment of drawing 11, it was required to wash injection nozzle 10a which stopped injection. Since disconnecting an electric wire 6 was performed while stopping electric-wire extrusion Rhine by this washing, there was same trouble with having mentioned above.

[0015] Therefore, in view of the conventional trouble mentioned above, a configuration is easy, this invention is cheap, and there is little failure, and it sets it as the main purpose to offer the \*\*\*\*\* band marking equipment which can give a desired band mark to \*\*\*\*\* which moreover moves at high speed.

[0016] Moreover, this invention sets it as the 2nd purpose to offer the \*\*\*\*\* band marking equipment it enabled it to perform, without having suspended transit of \*\*\*\*\* for the recoloring of the band mark given to \*\*\*\*\* in view of the conventional trouble mentioned above, or cutting \*\*\*\*\*.

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MEANS

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[Means for Solving the Problem] The \*\*\*\*\* band marking equipment accomplished by this invention in order to attain the above-mentioned main slack purposes The air bulb which has the inlet port to which air is supplied from the source of air supply, and the outlet which emits the air supplied to this inlet port, opens and closes the passage between said inlet ports and outlets, and was made to perform emission and cutoff of the air from said outlet, The venturi tube section which is connected with said outlet of this air bulb, extracts the air emitted from this outlet, and raises the rate of flow, It is characterized by having the coating supply noise which is projected by these venturi tube circles and supplies a coating, atomizing the coating supplied to said venturi tube circles from a coating supply nozzle by the air emitted from the outlet of said air bulb, blowing off on the surface of \*\*\*\*\*, and giving a band mark.

[0018] The \*\*\*\*\* band marking equipment accomplished by this invention in order to attain the 2nd purpose of the above changes the color of the coating which supplies the above-mentioned \*\*\*\*\* band marking equipment from said coating supply nozzle of two or more preparations and monograph length object band marking equipment, and is characterized by giving a multicolor band mark to the front face of said \*\*\*\*\*.

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[Translation done.]

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OPERATION

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[Function] By an air bulb opening and closing the passage between an inlet port and an outlet, and performing emission and cutoff of the air from an outlet by the above-mentioned configuration Only the period when emission of the air from an air bulb to the venturi tube section was controlled at, and air was emitted to the venturi tube section with the air accelerated here Since the coating currently supplied from the coating supply noise is atomized, and blows off and a band mark is given on the surface of \*\*\*\*\* by this jet coating, there is no moving-part material seemingly, and the change rate of jet of a coating is dependent only on the closing motion rate of the passage in an air bulb.

[0020] Moreover, since the coating currently supplied from the coating supply noise is atomized and blows off, even if a coating does not remain to venturi tube circles and it stops jet of a coating, it is not necessary to wash the venturi tube section.

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[Translation done.]

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EXAMPLE

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[Example] Hereafter, the example of this invention is explained based on a drawing. Drawing 1 shows the electric-wire band marking equipment which is one example of the \*\*\*\*\* band marking equipment by this invention. the electromagnetism which intercepts and emits the air supplied in this drawing from the source of air supply which does not illustrate electric-wire band marking equipment 10 -- it has the drive-type air bulb 101. Air inlet 101a is formed in the periphery section, and air-outlet 101b is formed in the center section at the air bulb 101, respectively. And valve element 101c to which the air which opened and closed passage and was supplied to air inlet 101a makes it emit from air-outlet 101b, or intercepts emitting is prepared in the airstream way which connects air inlet 101a and air-outlet 101b. [0022] valve portion 101c1 which valve element 101c consists of a magnetic material, and opens and closes passage electromagnetism -- the adsorption section 101c2 inserted into the coil 101d centrum from -- it becomes. valve element 101c -- electromagnetism -- coil spring 101f \*\*\*\*(ed) between piece of adsorption 101e of the shape of a cap fixed in the coil 101d centrum -- always -- passage -- valve portion 101c1 although energized in the closed direction -- electromagnetism -- if it energizes to coil 101d, the coil spring 101f energization force will be resisted, and it will be drawn in by piece of adsorption 101e, and will be held at the open condition of illustration.

[0023] Electric-wire band marking equipment 10 has the venturi tube section 102 connected with air-outlet 101b of the air bulb 101, and this venturi tube section 102 extracts the air emitted from air-outlet 101b, and raises the spray velocity. The tip of the coating supply nozzle 103 is projected in the venturi tube section 102, and the coating from the coating tank 105 is supplied through the pipe 104 linked to the back end of the coating supply nozzle 103 out of the venturi tube section 102. The cock 106 for coating flow control is formed in the middle of the pipe 104.

[0024] If valve element 101c of the air bulb 101 carries out open like illustration, from air-outlet 101b, air will be emitted, this air will be accelerated in the venturi tube section 102, and it will blow off from the outlet of the venturi tube section 102. At this time, in the venturi tube section 102, the coating from the coating supply noise 103 with which the tip is projected is atomized, and it blows off together with air. The coating which was atomized and blew off from the venturi tube section 102 is restricted by slit 107a of the mask plate 107 which adjoined the electric wire 6 it is running in the direction of an arrow head, and has been arranged, the front face of an electric wire 6 adheres to the coating which passed along this slit 107a, and the band mark M is given to an electric wire 6.

[0025] the electromagnetism of the air bulb 101 -- if the energization to coil 101d is solved, as valve element 101c is moved by the energization force by spring coil 101f and it is shown in drawing 2, the airstream way which connects air inlet 101a and air-outlet 101b will be closed, and it will intercept that the air currently supplied to air inlet 101a is emitted from air-outlet 101b. Therefore, the coating supplied through the coating supply noise 103 in the venturi tube section 102 is atomized, and it does not blow off together with air.

[0026] In addition, while a required coating is absorbed in the venturi tube section 102 from the tip of the coating supply nozzle 103 by suction by this airstream while air is blowing off from the venturi tube section 102, and air is not blowing off by adjustment of the coating amount of supply by the flow control cock 106, a coating is made not to be dropped in the venturi tube section 102 from the coating supply nozzle 103.

[0027] As explained above, since a band mark can be given to the front face of an electric wire 6, while being able to turn jet of a coating on and off at high speed, only by carrying out the switching action of the valve element 101c of the air bulb 101, moving-part material can be lost externally, and structure



becomes easy so much, and it is cheap and can consider as equipment with little failure.

[0028] Moreover, since carry out open and air is made to emit in the venturi tube section 102 from air-outlet 101b, and valve element 101c of the air bulb 101 atomizes the coating from the coating supply nozzle 103 and is blowing off with this air when giving a band mark to the front face of an electric wire 6, the venturi tube section 102 can be made into what has a comparatively big bore. Moreover, when valve element 101c of the air bulb 101 closes and air is no longer emitted to the venturi tube section 102, a coating does not remain in the venturi tube section 102. Therefore, coating supply nozzle 1031-1032 which supplies two or more coatings with which colors differ in the venturi tube section 102 as show in drawing 3 R> 3 The color of the band mark give on the surface of an electric wire is easily replaceable by make a tip project and open alternatively the cock who prepared in the pipe between these coating supply nozzles and coating tanks, respectively.

[0029] Since a coating does not remain in the venturi tube section 102 when air is intercepted and jet of a coating is stopped, as mentioned above As shown in drawing 4 , they are two or more air bulbs 1011-1014. The venturi tube section 1021-1024 connected, respectively While summarizing an outlet to one each venturi tube section 1021-1024 Coating tank 1051-1054 which held the coating of a different color from -- coating supply nozzle 1031-1034 which supplies a coating It prepares. Air bulb 1011-1014 By opening and closing a valve element alternatively at high speed, the band mark of the monochrome from which versatility differs, or a mixed color can be given to an electric wire 6 now.

[0030] Moreover, as shown in drawing 5 , the electric-wire band marking equipment of a configuration of having mentioned above about drawing 1 On both sides of an electric wire 6, a location is shifted in the transit direction, and it arranges four at a time, and is equipment 101. 105 And equipment 102 And 106 Like Moreover by making two equipments which counter into a group and making the coating of the same color blow off, the band mark covering the perimeter of an electric wire 6 can be given without washing combining various colors with multiple color.

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[Translation done.]

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is drawing showing one example of the \*\*\*\*\* band marking equipment by this invention.

[Drawing 2] It is drawing showing other operating state of the equipment of drawing 1.

[Drawing 3] It is drawing showing some modifications of the equipment of drawing 1.

[Drawing 4] It is drawing showing other examples of the \*\*\*\*\* band marking equipment by this invention.

[Drawing 5] It is drawing showing the example of further others of the \*\*\*\*\* band marking equipment by this invention.

[Drawing 6] It is drawing showing the configuration of electric-wire extrusion Rhine where the equipment by this invention is applied.

[Drawing 7] It is drawing showing an example of conventional electric-wire marking equipment.

[Drawing 8] It is drawing for explaining the principle of band marking.

[Drawing 9] It is drawing showing the example of the band mark given to the electric wire.

[Drawing 10] It is drawing showing a concrete example of the recoloring of the band mark performed using one injection nozzle.

[Drawing 11] It is drawing showing an example of electric-wire marking equipment which gives a multicolor band mark.

[Drawing 12] It is drawing showing an example of the multicolor band mark given to the electric wire with the equipment of drawing 11.

[Description of Notations]

6 Electric Wire (Article Length Object)

10,101-106 Electric-wire marking equipment

M Bandeau mark

101 Air Bulb

101a Air inlet (inlet port)

101b Air outlet (outlet)

102 Venturi Tube Section

103 Coating Supply Nozzle

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[Translation done.]

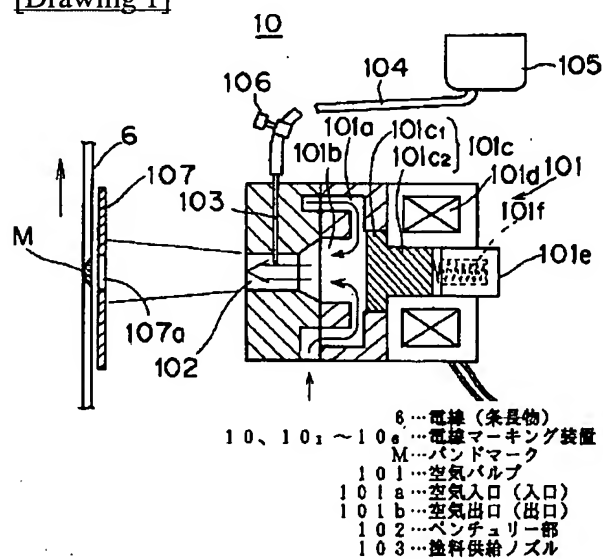
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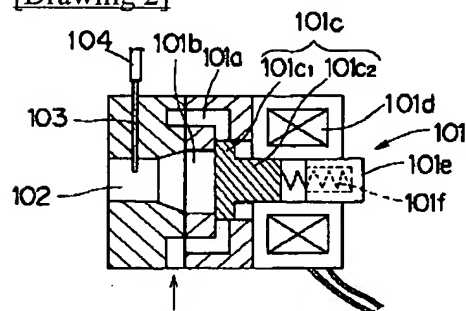
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## DRAWINGS

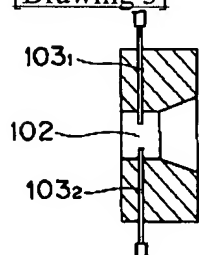
[Drawing 1]



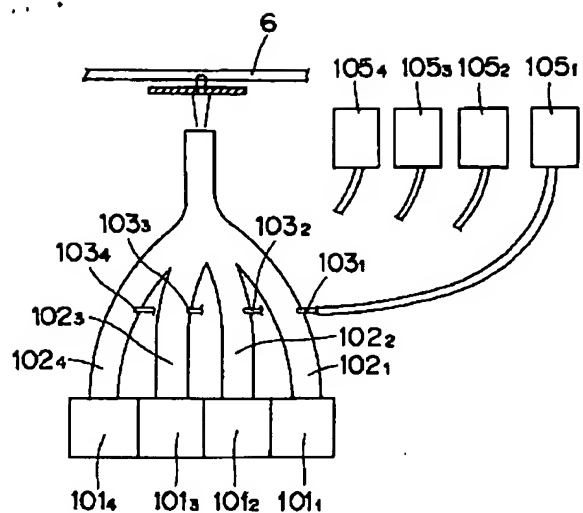
[Drawing 2]



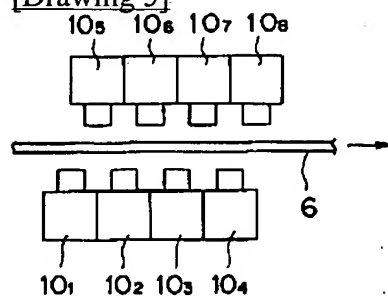
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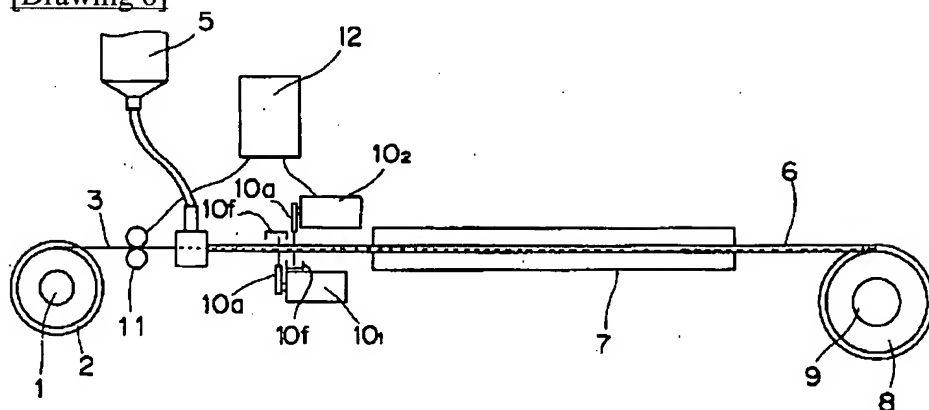
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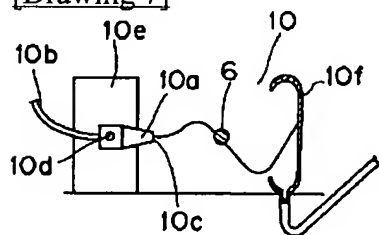
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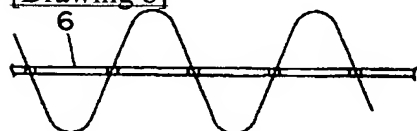
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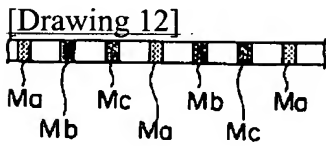
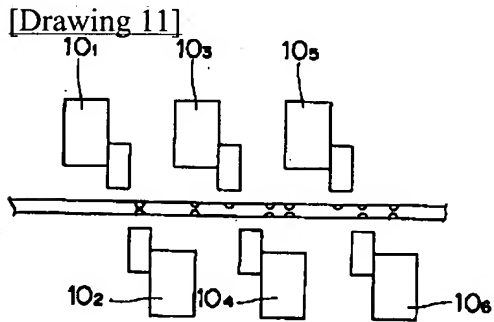
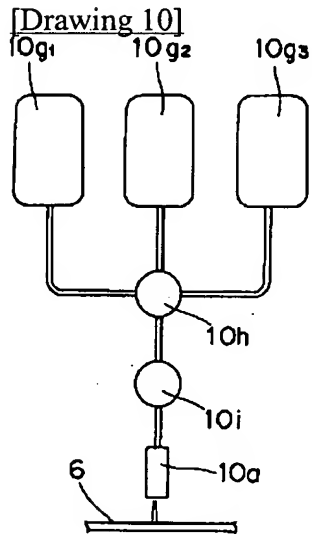
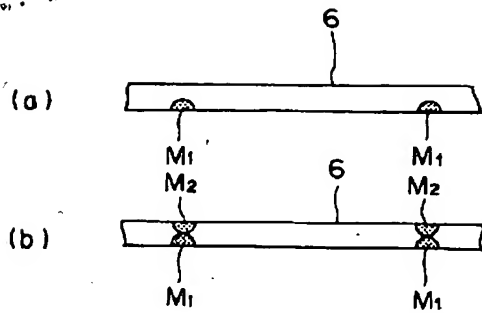
[Drawing 7]



[Drawing 8]



[Drawing 9]



[Translation done.]